



PVC REPAIR COUPLING / DWV STACK EXPANSION JOINT INSTALLATION INSTRUCTIONS

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Spears® S118/S119 and SH118/SH119 series repair couplings are ideal for quick leak repairs and thermal expansion compensation in pressure applications. Spears® S118 & S119 can also be used as DWV vertical stack drainage application expansion joints to accommodate thermal dynamics and building settlement in DWV piping systems. Available in nominal pipe sizes from 1/2" to 6" with various stroke lengths. Read all applicable instructions and procedures thoroughly before starting. Suitability of the intended service application must be determined prior to installation. Expansion Joints require specific positioning on an axial alignment. PVC piping systems must be engineered, installed, operated and maintained in accordance with accepted standards and procedures for thermoplastic piping systems. It is absolutely necessary that all personnel associated with the above be properly trained in these procedures before starting.

PRECAUTIONS AND WARNINGS

NOT FOR DISTRIBUTION OF COMPRESSED AIR OR GAS

CAUTION: The system must be designed and installed to avoid stress loads other than the purpose designed expansion/contraction along the longitudinal [lengthwise] axis of the Expansion Joint. Pipe must be cut and supported so that all stress loads associated with bending or shifting are avoided. Expansion Joint must be supported to maintain axial alignment.

CAUTION: BEFORE THE JOINT IS CYCLED, all dirt, sand, grit or other material must be wiped externally from the piston/sleeve and internally flushed from the system. This is to prevent scarring of internal components; e.g., piston sleeve, O-rings, piston bore, etc.

WARNING: Systems must not be operated or flushed out at flow velocities greater than 5 feet per second.

LUBRICATION WARNING: Some lubricants, including vegetable oils, are known to cause stress cracking in thermoplastic materials. Lubricants are not required for installation of Spears® Repair Couplings/Expansion Joints.

All air must be bled from pressurized systems during initial fluid fill. Pressure testing of the system must not be made until all solvent cement joints have properly cured. Initial pressure testing must be made at approximately 10% of the system hydrostatic pressure rating to identify potential problems, prior to testing at higher pressures.

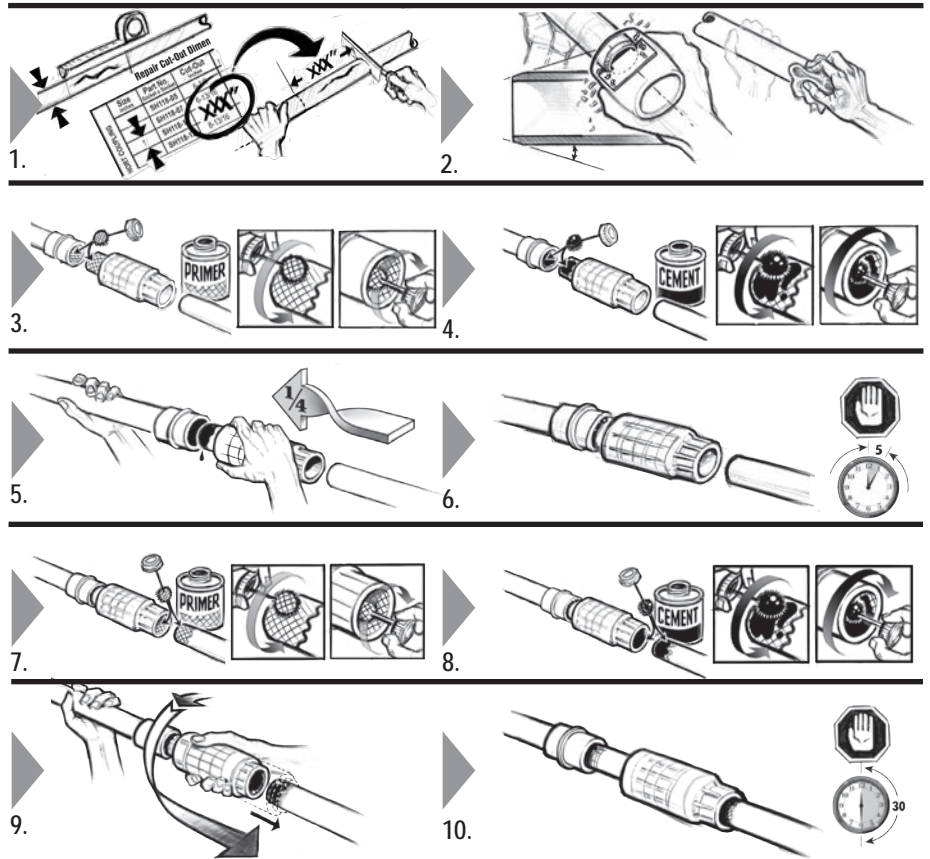
REPAIR COUPLING INSTALLATION INSTRUCTIONS

Spears® Repair Couplings provide a variety of system repairs and alteration solutions. Use Socket x Socket (S119/SH119) configurations for quick pipe damage repair. Spigot x Socket (S118/SH118) configurations are excellent for damaged fitting or valves installation in existing piping systems.

Twist-Lock Feature

Spears® Repair Couplings utilize a lock that initially immobilizes the shaft for easy 1/4-turn joint make up. After initial cement set, a reverse 360° twist activates a cam release to easily move telescoping shaft.

	Size inches	Part No. Spigot x Socket	Cut-Out inches	Part No. Spigot x Socket	Cut-Out inches
	SHORT COUPLING	1/2	SH118-05	5-1/4	SH119-05
3/4		SH118-07 SH118-07CO	5-3/4	SH119-07	6-13/16
1		SH118-05 SH118-10CO	5-7/8	SH119-10	7-1/16
1-1/4		SH118-12	6-3/4	SH119-12	8-1/8
1-1/2		SH118-15	7-1/16	SH119-15	8-7/16
2		SH118-20	8-7/16	SH119-20	10-1/16
STANDARD COUPLING	1/2	S118-0-5	6-5/8	S119-0-5	7-5/8
	3/4	S118-0-7	7-15/16	S119-0-7	9-1/16
	1	S118-10	8-9/16	S119-10	9-13/16
	1-1/4	S118-12	9	S119-12	10-5/16
	1-1/2	S118-15	9-7/16	S119-15	10-3/4
	2	S118-20	10-3/16	S119-20	11-3/4
	2-1/2	S118-25	13-7/8	S119-25	15-11/16
	3	S118-30	13-7/8	S119-30	15-7/8
4	S118-40	15-3/8	S119-40	17-13/16	
6	S118-60	17-11/16	S119-60	21	



EXPANSION JOINT INSTALLATION - DETERMINE TRAVEL LENGTH REQUIRED

Spears® Repair Couplings can be used as expansion joints to compensate for thermal expansion & contraction in pressure piping and DWV vertical stack applications. System expansion and contraction must be calculated and is determined from anticipated temperature change in the system from both ambient and internal fluid temperatures.

General Rule of Thumb for All Pipe Diameters

PVC: Allow 3/8" expansion for every 10°F (5.6°C) change in temperature per 100 feet of pipe. For example, a 4" travel expansion joint will accommodate approximately 100°F temperature change in 100 ft. of PVC pipe (10 x 3/8" = 3-3/4").

Approximate Travel Length for Various Changes in System Temperature

Amount of Temperature CHANGE	10°F	30°F	50°F	70°F	90°F	100°F	120°F	140°F
	6° C	17° C	28° C	39° C	50° C	56° C	67° C	78° C
PVC length change per 100 ft.	3/8"	1-1/8"	1-7/8"	2-5/8"	3-3/8"	3-3/4"	4-1/2"	5-1/4"

(Maximum material operating temperature: PVC = 140°F (60°C))

EXPANSION JOINT INSTALLATION – DETERMINE PISTON INSTALLATION POSITION

Initial positioning of the Expansion Joint piston (P) depends on the anticipated temperature change in relation to the system temperature at the time of installation. The extended position for installation may be adjusted to specific system temperature and installation parameters using the following calculation:

Example: A straight run of pipe will operate in conditions where the maximum temperature (T) will be 110°F, the lowest temperature (F) will reach 60°F and the actual temperature (A) at installation is 75°F and maximum joint extension (E) is found in Table 1 (4" piston length used). Calculate as follows:

$$\frac{T - A}{T - F} \times E = P \quad \triangleright \quad \frac{110^\circ - 75^\circ \text{ F}}{110^\circ - 60^\circ \text{ F}} \times 4 = P \quad \triangleright \quad \frac{35}{50} \times 4 = P \quad \triangleright \quad 0.7 \times 4" = 2.8"$$

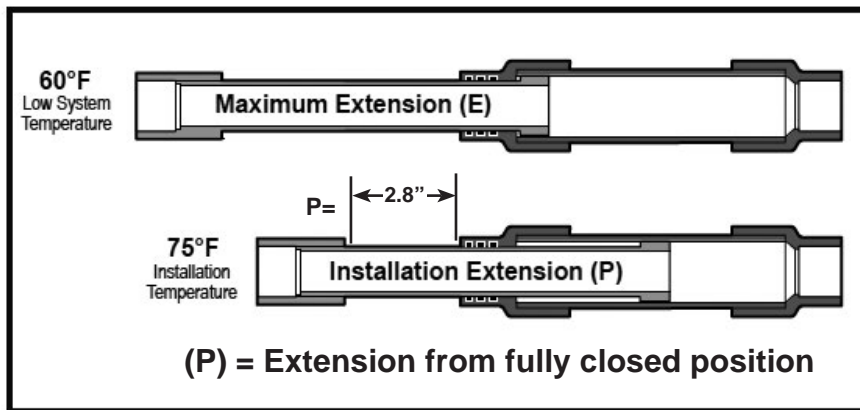
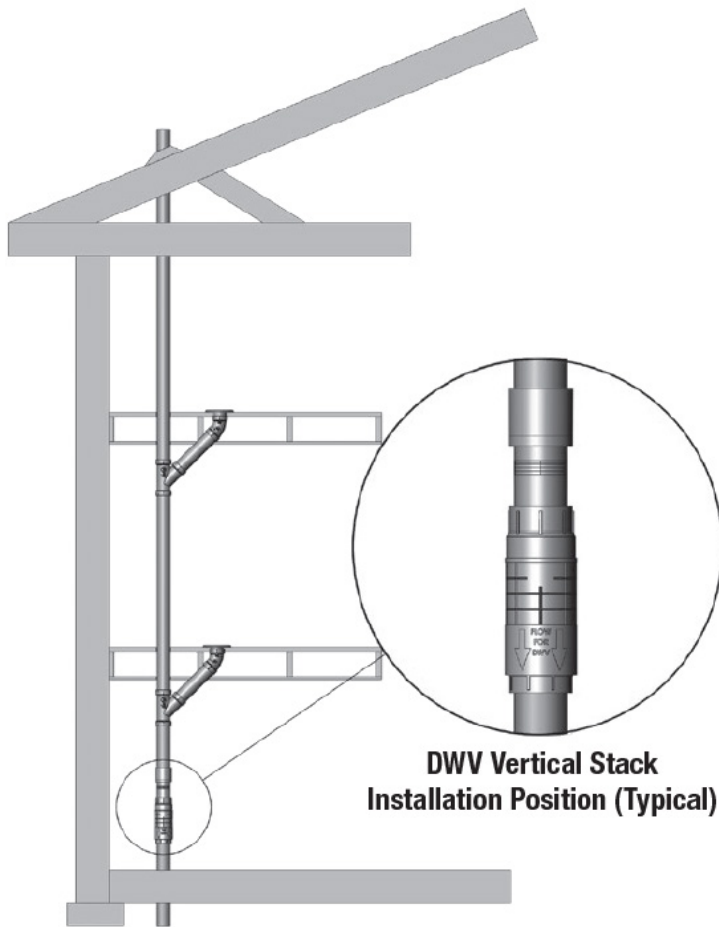


Table 1

Part#	Piston Length
S118-05/S119-05	3
S118-07/S119-07	4
S118-10/S119-10	4
S118-12/S119-12	4
S118-15/S119-05	4
S118-20/S119-20	4
S118-25/S119-25	6
S118-30/S119-30	6
S118-40/S119-40	6
S118-60/S119-60	6

EXPANSION JOINT INSTALLATION INSTRUCTIONS FOR DWV VERTICAL STACK DRAINAGE



The Spears® S118 & S119 series expansion joint can be used in DWV vertical stack drainage applications in accordance with manufacturer's installation recommendations. According to Model Plumbing Codes, listed expansion joints may be utilized to compensate for expansion and contraction in DWV vertical stack runs every thirty (30) feet (9,144 mm). Check local codes.

Installation Preparation:

- Support, but do not rigidly restrain piping at changes of direction.
- Holes through framing members must be adequately sized to allow for free pipe movement.
- Install expansion joint in a manner that takes into account the ambient temperature in which it will be installed. See Expansion Joint Installation—Determine Piston Installation Position.
- While Spears® Expansion Joints are maintenance-free, access panels are recommended.

DWV Vertical Installation Instructions:

Vertical Installation: (Sizes: 1-1/2" through 6") Locate expansion joint with arrow in direction of flow beneath the lowest fixture (piston side up) using appropriate anchors placed directly behind the expansion joint to secure the expansion body (outer sleeve) in place. On the piston side of the expansion joint, use appropriate bracket guides in close proximity of the piston to allow the piston to move freely yet restrict lateral pipe movement directing expansion into the joint's piston. Follow solvent cement joining procedures located in this bulletin.

EXPANSION JOINT INSTALLATION INSTRUCTIONS FOR PRESSURE APPLICATIONS

Alignment is critical, axial guides should be installed to direct straight movement into expansion joint.

Support & Thrust Block system to prevent binding of unit or system damage during operation.

Protect cylinder shaft from scratches, damage and debris to prevent leaks.

Solvent Cement end connections according to procedures shown at the end of this instruction.

Do Not allow solvent cement to contact cylinder shaft or interior surface. Follow cement manufacturer's instructions for proper application, set and cure time.

Painting – Where painting piping with a white latex paint is used to inhibit sun exposure, do not apply paint to telescoping shaft of the Expansion Joint to prevent possible damage to internal seals.

Direct Burial – Expansion Joints and telescoping shaft must be covered with a suitable shield in direct burial systems to prevent damage from dirt or sediment. Anchoring or thrust blocking and alignment must be maintained.

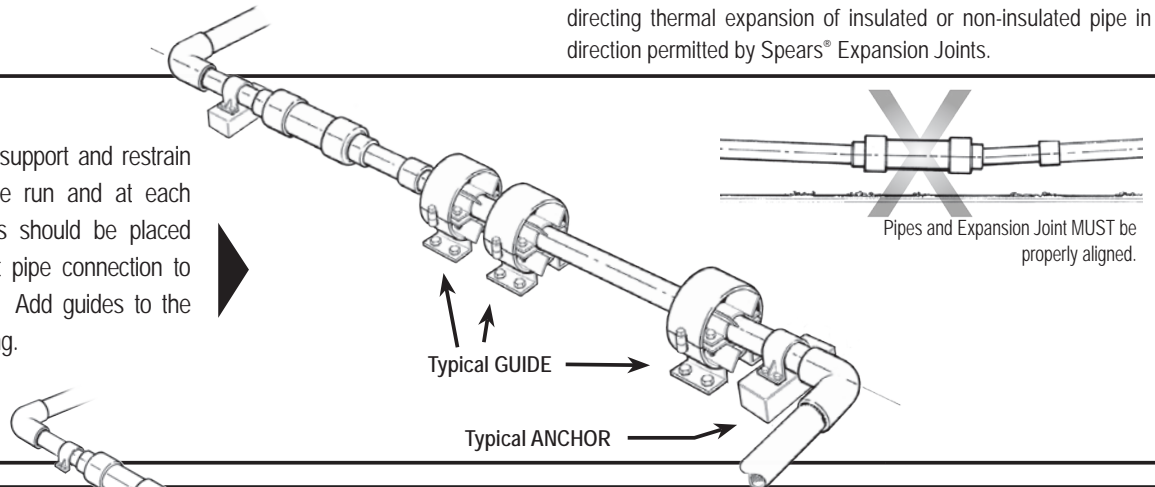
Anchor Support & Guides Use – Anchors support all loads and restrain piping at key points in order to force movement towards the Expansion Joint(s). Guides are not pipe supports, but must be rigidly attached to sub-structure to maintain alignment and restrict lateral movement while allowing free longitudinal movement. When metal IPS sized pipe guides are used, care must be taken to remove all burrs and sharp edges from the pipe clamp. Do not over tighten clamp around pipe to avoid damage. Vertical lines also require adequate support intervals to prevent excessive loading to lower fittings. The Expansion Joint should be positioned at an anchor for support with the first guide near the telescoping shaft connection and a second guide relatively close to the first to aid alignment. Follow standard industry guidelines.

TYPICAL EXPANSION JOINT INSTALLATION

PIPE ALIGNMENT GUIDES are designed for use in directing thermal expansion of insulated or non-insulated pipe in the direction permitted by Spears® Expansion Joints.

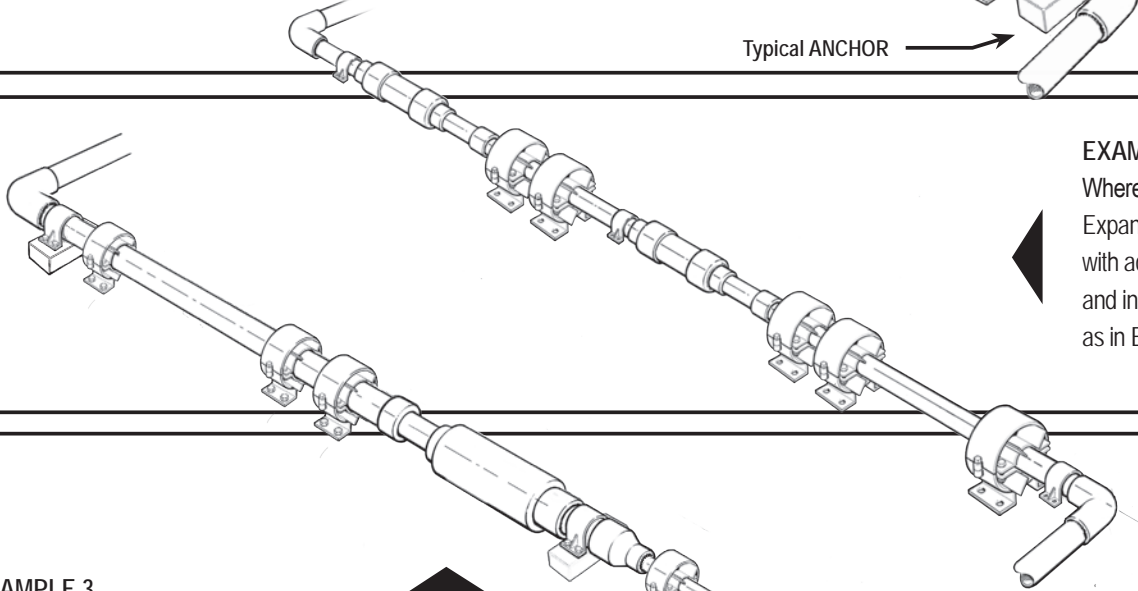
EXAMPLE 1

Anchors are required to support and restrain pipe at each end of the run and at each Expansion Joint. Guides should be placed close to the piston shaft pipe connection to maintain axial alignment. Add guides to the pipe run to prevent snaking.



EXAMPLE 2

Where calculations require two Expansion Joints, divide run equally with additional anchor in the center and install with guides for support as in Example 1.



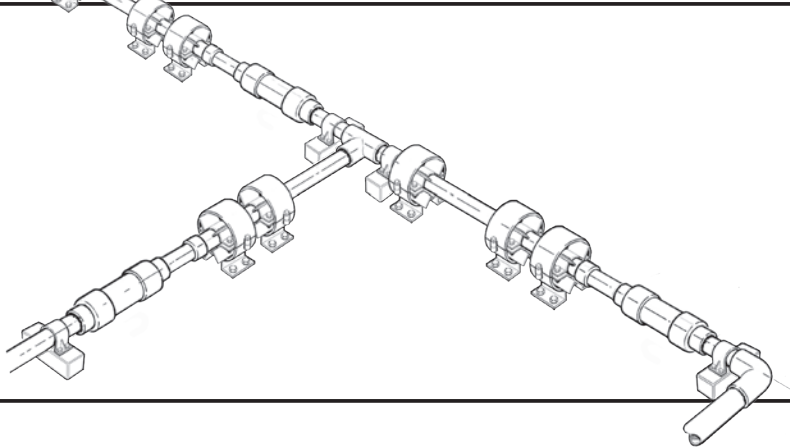
EXAMPLE 3

While expansion is not determined by pipe diameter, a separate Expansion Joint for each diameter is recommended. Install anchors at each end of run and at the reduction location. Install with guides for support as in Example 1.



EXAMPLE 4

Branched runs should be divided into segments and anchored at the end of each run and in each direction at the Tee branch. Install with guides for support as in Example 1.



CAUTION

Internal pressure can cause extension movement in the telescoping joint unless installed in fully extended position. Most Repair Couplings and Expansion Joints must be installed in an intermediate position, requiring thrust blocking and restraints to prevent system movement.



SPEARS® MANUFACTURING COMPANY
15853 Olden Street, Sylmar, CA 91342
PO Box 9203, Sylmar, CA 91392
(818) 364-1611 • www.spearsmfg.com

